

WHAT IS CLAIMED IS:

1. A heat exchanger comprising:

- a. a core having a variable size; and
- b. a support structure connected to the core, the support structure having a deformable member for accommodating variations in the size of the core.

2. The heat exchanger of Claim 1, wherein the support structure further comprises a biasing member for applying a biasing force to the core.

3. The heat exchanger of Claim 2, wherein the deformable member comprises a tension spring.

4. The heat exchanger of Claim 3, wherein the biasing member comprises the tension spring.

5. The heat exchanger of Claim 2, wherein the deformable member comprises a compression spring.

6. The heat exchanger of Claim 5, wherein the biasing member comprises the compression spring.

7. The heat exchanger of Claim 2, wherein the deformable member comprises a bellows.

8. The heat exchanger of Claim 8, wherein the biasing member comprises the bellows.

9. The heat exchanger of Claim 2, wherein the deformable member comprises a piston assembly.

10. The heat exchanger of Claim 9, wherein the biasing member comprises the piston assembly.

5 11. A heat exchanger comprising:

- a. a core having a variable length; and
- b. a support structure, wherein the core is received by the support structure, wherein the support structure comprises a fixed member and an attached biased deformable member for accommodating variations in the length of the core while applying a biasing force to the core.

10 12. The heat exchanger of Claim 11, wherein the biased deformable member comprises a tension spring.

15 13. The heat exchanger of Claim 11, wherein the fixed member comprises a first portion and a second portion, wherein the first portion and the second portion are positioned about the core, wherein the first portion and the second portion are in contact with the core, wherein the biased deformable member is mounted between the
20 first portion and the second portion.

25 14. The heat exchanger of Claim 13, wherein the biased deformable member comprises a tie rod, wherein the tie rod comprises a coiled spring section, so that the tie rod is deformable to accommodate variations in the length of the core while applying a biasing force to the first portion and second portion of the fixed member.

30 15. The heat exchanger of Claim 14, wherein the tie rod is shaped into the coiled spring section.

16. The heat exchanger of Claim 15, wherein the tie rod is substantially

aligned with the variable length of the core.

17. The heat exchanger of Claim 13, wherein the biased deformable member is a tie rod, wherein the tie rod comprises a spiral spring section, so that the tie rod is deformable to accommodate variations in the length of the core while applying a biasing force to the first portion and second portion of the fixed member.

18. The heat exchanger of Claim 17, wherein the tie rod is shaped into the spiral spring section.

19. The heat exchanger of Claim 13, wherein the biased deformable member is a tie rod, wherein the tie rod comprises a shaped spring section, so that the tie rod is deformable to accommodate variations in the length of the core while applying a biasing force to the first portion and second portion of the fixed member.

20. The heat exchanger of Claim 19, wherein the shaped spring section of the tie rod has a non-linear shaped section.

21. The heat exchanger of Claim 19, wherein the shaped spring section of the tie rod is a s-shaped section.

22. The heat exchanger of Claim 21, wherein the tie rod is shaped into the s-shaped section.

23. The heat exchanger of Claim 22, wherein the tie rod is substantially aligned with the variable length of the core.

24. The heat exchanger of Claim 19, wherein the shaped spring section of the tie rod is a wave shaped section.

25. The heat exchanger of Claim 11, wherein the biased deformable

member comprises a compression spring.

26. The heat exchanger of Claim 13, wherein the biased deformable member comprises a tie rod and a compression spring, so that the compression spring is deformable to accommodate variations in the length of the core while applying a biasing force to the first portion and second portion of the fixed member.

27. The heat exchanger of Claim 26, wherein the tie rod has a first end, wherein the compression spring is positioned between the end of the tie rod and the first portion of the fixed member, so that a biasing force is exerted by the deformable member on to the first portion and second portion with the tie rod in tension and the compression spring in compression.

28. The heat exchanger of Claim 27, wherein the compression spring comprises a coil spring.

29. The heat exchanger of Claim 28, wherein the tie rod is substantially aligned with the variable length of the core.

30. The heat exchanger of Claim 27, wherein the compression spring comprises a Belleville washer.

31. The heat exchanger of Claim 13, wherein the biased deformable member comprises a tie rod, a first compression spring and a second compression spring, wherein the tie rod has a first end and a second end, wherein the first compression spring is positioned between the first end of the tie rod and the first portion of the fixed member, wherein the second compression spring is positioned between the second end of the tie rod and the second portion of the fixed member, so that the first compression spring and the second compression spring are deformable to accommodate variations in the length of the core while applying a biasing force to the first portion and second portion of the fixed member.

32. The heat exchanger of Claim 11, wherein the fixed member comprises a first end and a second end, wherein the first end and the second end are positioned about the core, wherein the first end is in contact with the core, wherein the biased deformable member is mounted between the core and the second end of the fixed member, so that the biased deformable member is deformed as the length of the core varies.

33. The heat exchanger of Claim 32, wherein the biased deformable member is a compression spring.

34. The heat exchanger of Claim 33, wherein the biased deformable member is a coil spring.

35. The heat exchanger of Claim 33, wherein the biased deformable member is a corrugated spring.

36. The heat exchanger of Claim 33, wherein the biased deformable member is a plurality of coil springs.

37. The heat exchanger of Claim 32, wherein the biased deformable member is a bellows.

38. The heat exchanger of Claim 37, wherein the bellows is wider than the core.

39. The heat exchanger of Claim 32, wherein the biased deformable member is a plurality of bellows.

40. The heat exchanger of Claim 39, wherein the plurality of bellows are aligned axially.

41. The heat exchanger of Claim 39, wherein the plurality of bellows are positioned adjacent one another.

42. The heat exchanger of Claim 37, wherein the bellows comprises a first plate, a second plate and an expandable side wall mounted between the first plate and the second plate.

43. The heat exchanger of Claim 32, wherein the biased deformable member is a piston assembly.

44. The heat exchanger of Claim 37, wherein the piston assembly is wider than the core.

45. The heat exchanger of Claim 32, wherein the biased deformable member is a plurality of piston assemblies.

46. The heat exchanger of Claim 45, wherein the plurality of piston assemblies are aligned axially.

47. The heat exchanger of Claim 45, wherein the plurality of piston assemblies are positioned adjacent one another.

48. The heat exchanger of Claim 43, wherein the piston assembly comprises a cylinder and a piston received by the cylinder.

49. The heat exchanger of Claim 11, wherein the core comprises a first end and a second end, wherein the variable length of the core is set between the first end and the second end, wherein the fixed member comprises a first section and a second section, wherein the first section of the fixed member abuts the first end of the core, wherein the biased deformable member is mounted between the second end of the core and the second section of the fixed member, so that the biased deformable

member is deformed as the length of the core varies.

50. The heat exchanger of Claim 49, wherein the biased deformable member is a compression spring.

51. The heat exchanger of Claim 49, wherein the biased deformable member is a coil spring.

52. The heat exchanger of Claim 49, wherein the biased deformable member is a bellows.

53. The heat exchanger of Claim 52, wherein the bellows comprises a first plate, a second plate and an expandable side wall mounted between the first plate and the second plate.

54. The heat exchanger of Claim 49, wherein the biased deformable member is a piston assembly.

55. The heat exchanger of Claim 54, wherein the piston assembly comprises a cylinder and a piston received by the cylinder.

56. The heat exchanger of Claim 38, wherein the core is pressurized with a gas and wherein the bellows is in fluid communication with the core, so that the bellows has substantially the same gas pressure as the core.